



奇岩電子股份有限公司  
MOAI ELECTRONICS CORPORATION

# M110E

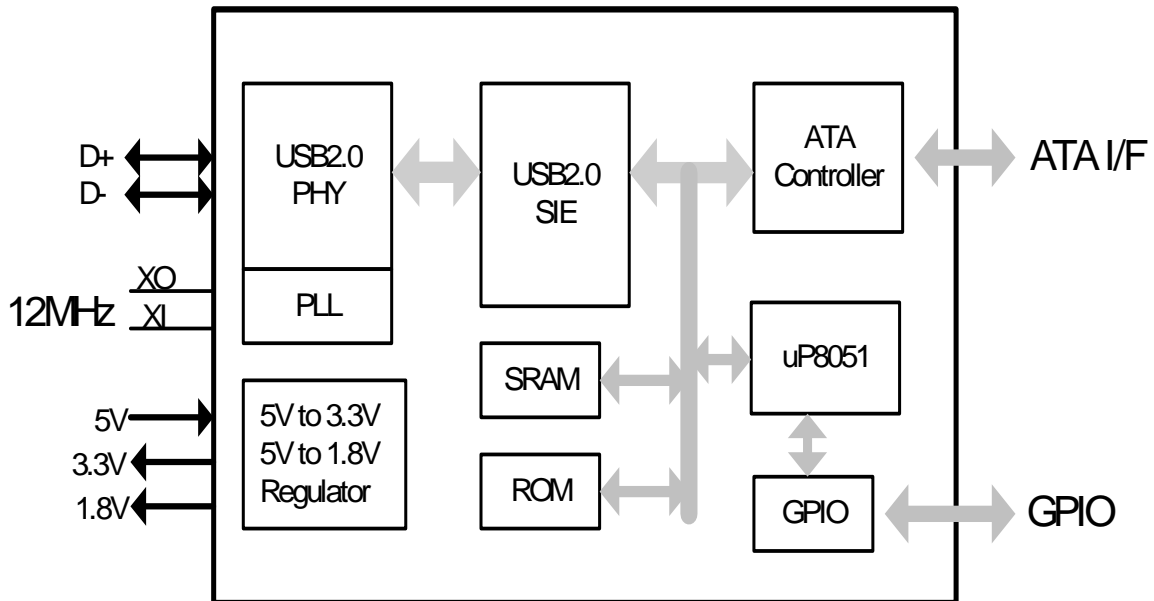
## USB 2.0 To IDE Bridge

## A. Features

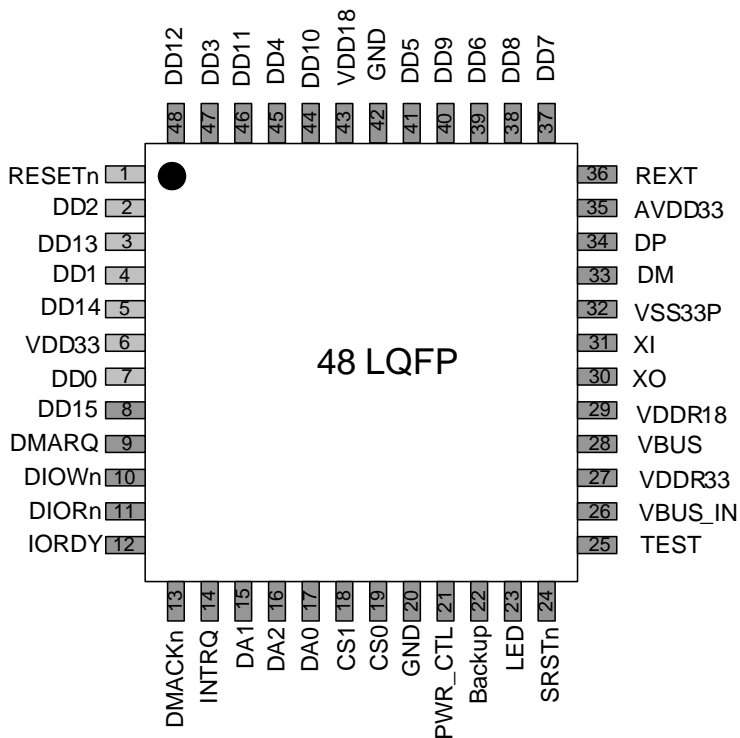
### ■ USB

- ✧ Fully compatible with USB 2.0/1.1 specification
- ✧ Support USB 2.0 specification for 480Mbit/sec and 12Mbit/sec operation
- ✧ USB Device Class Definition for Mass Storage , Bulk-Transport v1.0
- ✧ USB 2.0 Bus Power & Self Power device spec. compliance
- ✧ Endpoint:
  - Endpoint 0: 64 bytes control transfer.
  - Endpoint 1: 512 bytes bulk transfer for IN transaction.
  - Endpoint 2: 512 bytes bulk transfer for OUT transaction.
  
- ✧ **Work with the default driver from windows 2000/XP/ME, Mac9.2, Mac OS X, Linux 2.4.2**
  
- ✧ **Software features**
  - Backup/Scheduling backup / Restore supporting
  
- ✧ **ATA IDE Support**
  - Complies with ATA/ATAPI-6 Draft Specification
  - Support 28-bit/48-bit addressing
  - Support PIO modes 0,1,2,3,4 and UDMA modes 0,1,2,3,4
  - Support HDD, CD-ROM, CD-RW, CD-COMBO, DVD-ROM, DVD-RW
  
- ✧ **Embedded memory FIFO for data transfer**
- ✧ **User defines VID/PID through writing external EEROM**
- ✧ **Integrated 5V to 3.3V/1.8V Voltage Regulator**
- ✧ **Integrated PLL with 12MHz crystal input**
- ✧ **48 pin LQFP package**
- ✧ **Pin Backward with M110B**

## B. Block Diagram



## C. Pins Configuration



## D. Pin Description

### ● Power Pins

Symbol	Pin No.	Type	Description
VBUS	28	P	5V Bus Power input to internal regulator
VDDR18	29	P	Output 1.8V from internal regulator
VDDR33	27	P	Output 3.3V from internal regulator
VDD18	43	P	Logical power pin, input 1.8V
VDD33	6	P	Logical power pin, Input 3.3V
AVDD33	35	P	Analog power pin, Input 3.3V
VSS33P	32	P	Analog ground pin
GND	20,42	P	Logical ground pin

### ● Analog and Others Pins

Symbol	Pin No.	Type	Description
DM	33	A	USB D- for high/full speed
DP	34	A	USB D+ for high/full speed
XI	31	I	12 MHz crystal input
XO	30	O	12 MHz crystal output
REXT	36	I	To connect an external reference resistor for current source of the USB high-speed driver. The resistor with the range 330~400 ohm.
SRSTn	24	I	System reset
VBUS_IN	26	I	USB bus power valid
PWR_CTL	21	I	Output signal to turn on/off external CMOS switch. Normal operation output "High", USB enter suspend output "Low".
TEST	25	I	For TEST only. Connect this pin to ground
LED	23	O	Multi function pin. Normal operation is device status indication pin. This pin is as SCL pin for read VID/PID from EEROM when power on reset.
Backup	22	I/O	Multi function pin. Normal operation is one button backup pin. This pin is as SDA pin for read VID/PID from EEROM when power on reset.

### ● ATA Interface

Symbol	Pin No.	Type	Description
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DD0	7	I/O	ATA data
DD1	4		
DD2	2		
DD3	47		
DD4	45		
DD5	41		
DD6	39		
DD7	37		ATA data
DD8	38		
DD9	40		
DD10	44		
DD11	46		
DD12	48		
DD13	3		
DD14	5		
DD15	8		
RESETn	1	O	Reset the device
DMARQ	9	I	DMA request
DMACKn	13	O	DMA acknowledge
DIOWn	10	O	I/O write
DIORn	11	O	I/O read
IORDY	12	I	I/O ready
INTRQ	14	I	Interrupt request
DA0,DA1,DA2	17,15,16	O	Device address bit0,1,2
CS0n,CS1n	19,18	O	Chip select 0,1

## E. Electrical Characteristics

- Regulator

Parameter	Value
VBUS (5 volts input)	Min.=4.2 volts , Max.=5.8 volts
VDDR33 (3.3 volts output )	3.3 volts $\pm$ 10 %
VDDR18 (1.8 volts output )	1.8 volts $\pm$ 10 %
Maximum current	120 mA

- Analog and Digital power

Parameter	Value
AVDD33 (analog supply voltage)	3.3 volts $\pm$ 10 %
VDD33 (Digital supply voltage )	3.3 volts $\pm$ 10 %
VDD18 (Digital supply voltage )	1.8 volts $\pm$ 10 %

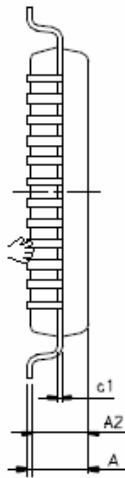
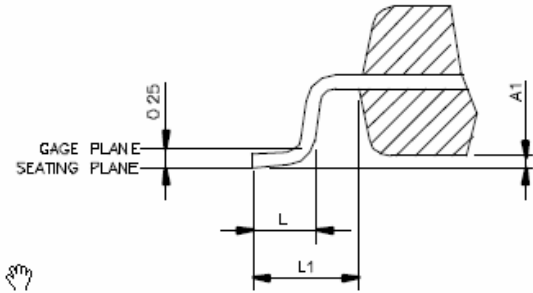
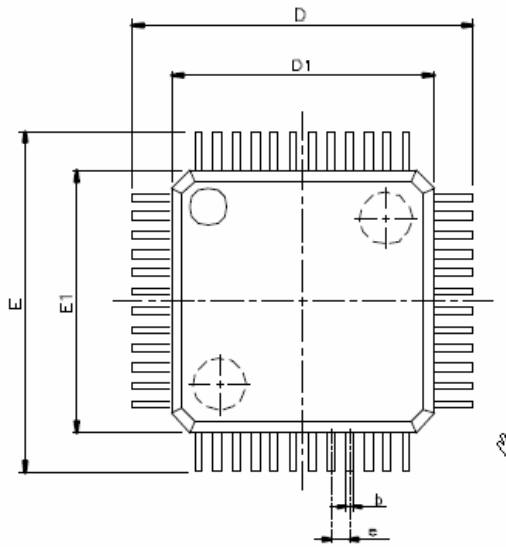
- Power consumption

Parameter	Value	Note
Normal operation	Min.= 40mA , Max. = 70mA	HDD power independent
Suspend current	Max.= 450 uA	HDD power independent & HDD enter sleep mode

- DP,DM characteristics

Parameter	Description
Eye-diagram test	Pass the USB eye-diagram test, so the DP,DM electrical characteristics such as eye-diagram, signal rate, rise time, fall time are met the specification.

## F. Package Information



VARIATIONS (ALL DIMENSIONS SHOWN IN MM)

SYMBOLS	MIN.	MAX.
A	--	1.6
A1	0.05	0.15
A2	1.35	1.45
c1	0.09	0.16
D	9.00 BSC	
D1	7.00 BSC	
E	9.00 BSC	
E1	7.00 BSC	
e	0.5 BSC	
b	0.17	0.27
L	0.45	0.75
L1	1 REF	